source. Fig. 2 shows an arrangement comprising three pulse generators of the type shown in Fig. 1 all charged in parallel and discharged in series. The folded-back foil 6 is replaced by a single foil 6A. The pulse is initiated by a breakdown of spark gaps at points X. Fig. 5 (not shown) relates to another multiple line circuit.

Fig. 4 shows a pulse generator comprising a pair of strip transmission lines formed by copper sheets 48, 8, 9 separated by a block 42 of polymothylmethacrylate. The lines are charged in parallel from a capacitor 56 charged by a Cockcrott-Walton generator (not shown) discharged into the pulse generator by lowering the sphere 53 so as to break down the spark gap 51, 52. Charging of the lines in parallel causes breakdown of three spark gap devices such as 17, 22 (of the type described in Specification 988,777) so that the lines are discharged in series as described above.

1,087,933. Pulse generating circuits. UNITED KINGDOM ATOMIC ENERGY AUTHORITY. Oct. 5, 1961 (Oct. 10, 1963) No. 39995/03. Addition to 975,911. Heading H3P

A pulse generator comprised two pairs of mutually insulated electrically conducting sheets 31, 33, 31, 33 rolled together to form two pairs of strip transmission lines, on of said pairs being located concentrically within the other and switch means (such as spark gap 26) arranged to discharge one only of each pair of strip transmission lines and generate voltage pulses between the ends of a given sheet of each pair. The two strip transmission lines may be arranged either in series as shown or in parallel as in Figs. 1, 2 (not shown). The inner and outer transmission lines may be wound in opposite directions, or as in Fig. 1 (not shown), in the same direction. The load may be connected via a further spark gap (Fig. 4, not shown) to point 27, the further spark gap being arranged to break down a the peak value of the short-duration triangular shaped, high voltage pulse generated by closing switch 26. Alternatively, the further spark gap in the load circuit may be applied to the pulse generator described in Specification 975,911, having one pair of strip lines.

1,161,347. Pulse generating circuits. UNITED KINGDOM ATOMIC ENERGY AUTHORITY. 2 Oct. 1967 (21 Oct. 1966). No. 47424/66. Heading H3P. (Also in Division H1)

A pulse generator comprises at least one capacitive energy store comprising at least two electrodes 15, 19 having the space between them filled with a polar liquid of high dielectric constant the configurations of said electrodes being such that when a voltage is applied between them a greater electric field

exists as the surface or one electrode 19 than at the other 15, the capacitive energy store being charged such that the one electrode 19 is negative relative to the other 15. When so polarized, the breakdown voltage may be several times that pertaining when the polarity is reversed. The differential electric field may be obtained by shaping the electrodes so as to present different surface areas to one another e.g. as shown, or by use of concentric construction (Fig. 1, not shown) or by having a common planar or I section electrode, co-operating with a rod on either side (Figs. 1, 7, not shown). Alternatively, plane electrodes of equal area may be employed each associated with a dielectric liquid of different conductivity or dielectric constant, the two liquids being isolated by a plastic film parallel to the electrodes. The dielectric liquid may be deionized water, ethylene glycol, glycerine or a lower alcohol, having dielectric constants in the range 81-20. A continuously operating ion exchanger can be included so as to maintain the water at low conductivity.

Delay line construction - The capacitive store shown may take to the form of a pair of delay lines 15, 18, 19 having a common electrode 15 formed of methyl methacrylate sheathed with copper foil of specified dimensions. Port 25 of electrode 18 is shaped so as to form with electrode 15 a liquid filled spark gap. The two delay lines are preferably connected as a Blumlein modulator and are charged from a Marx pulse generator 26 via a break tube 27 enclosed in methyl methacrylate 28, the field at the air/water interface being reduced by a polyethylene collar 29. The delay lines are housed in a methyl methacrylate tank 12 containing a deionized water and are coupled via matching devices 21. 21′ to an X-ray tube 22, of the type described in Specification 1,084,014.

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code by operating on the analogue signal with a multi-level slicer, as shown in Fig. 3, which successively slices the input signal at zero level and full wave rectifies the signal before applying it to the succeeding slicer. The rectifier folds the signal about zero level and the successive slicers provide the Gray coded binary output in parallel form. One stage of rectification and

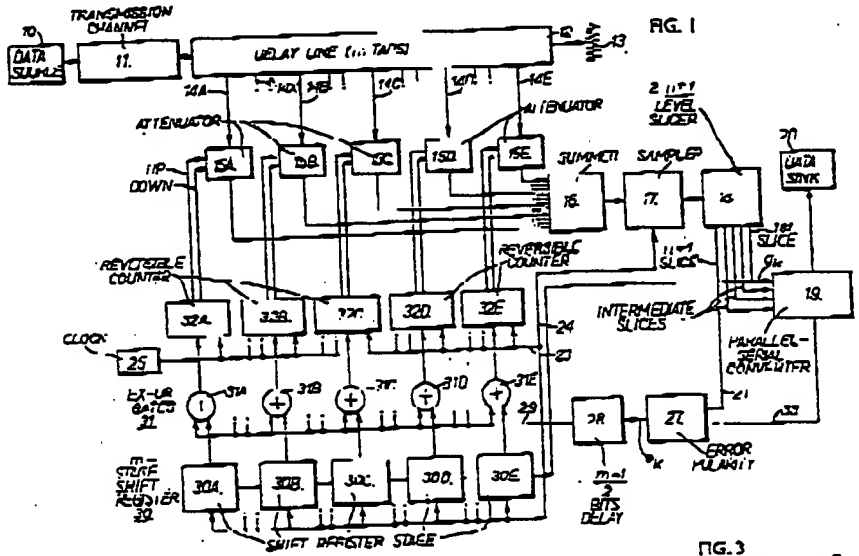


FIG. 1

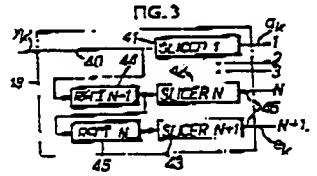


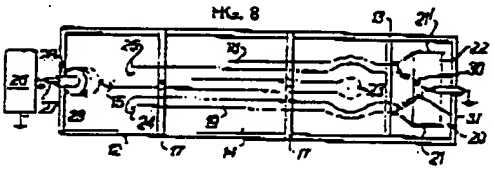
FIG. 3

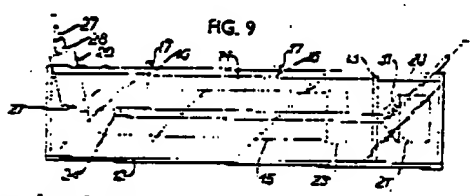
slicing is provided in excess of that required for recovering the signal content of the sample and this additional digital signal, the $(n+1)^{th}$ slicer output, is fed as an indication of the amplitude of the error over line 21. The actual polarity of the error is not defined by the $n+1$ slicer output but is dependent on the preceding slicer outputs. Lead 33 therefore provides an indication of the polarity of the digit supplied over lead 21, the Exclusive-or gate 27 then provides a signal to the delay 28 which indicates the actual polarity of the error. The remainder of the system is similar to that described in Specification 1,105,959 except that reversible counters 32 are provided in place of the low-pass filters and slicers of the previous application. The reversible counter is similar to an integrator with a long time constant, in that the error signal, applied to the "EXCLUSIVE-OR" gates 31 together with the main interference component from the shift register stage 30 causes an increase, or a decrease, in the count of the appropriate counter 32. When the counter reaches a predetermined count the respective attenuator counter 15 has its count increased or decreased by one, to adjust the attenuator on the tap appropriately, and the reversible counter 32 is reset to zero.

1,161,347. Pulse generating circuits. UNITED KINGDOM ATOMIC ENERGY AUTHORITY. 2 Oct., 1967 [21 Oct., 1966]. No. 47424/66. Heading H3F. [Also in Division H1]

A pulse generator comprises at least one capacitive energy store comprising at least two electrodes 15, 19 having the space between them filled with a polar liquid of high dielectric constant the configurations of said electrodes being such that when a voltage is applied between them a greater electric field exists at the surface of one electrode 19 than at the other 15, the capacitive energy store being charged such that the one electrode 19 is negative relative to the other 15. When so polarized, the breakdown voltage may be several times that pertaining when the polarity is reversed. The differential electric field may be obtained by shaping the electrodes so as to present different surface areas to one another e.g. as shown, or by use of concentric construction (Fig. 1, not

shown) or by having a common planar or I-section electrode, co-operating with a rod on either side (Figs. 4–7, not shown). Alternatively, plane electrodes of equal area may be





employed each associated with a dielectric liquid of different conductivity or dielectric constant, the two liquids being isolated by a plastic film parallel to the electrodes. The dielectric liquid may be deionized water, ethylene glycol, glycerine or a lower alcohol, having dielectric constants in the range 81—20. A continuously operating ion exchanger can be included so as to maintain the water at low conductivity.

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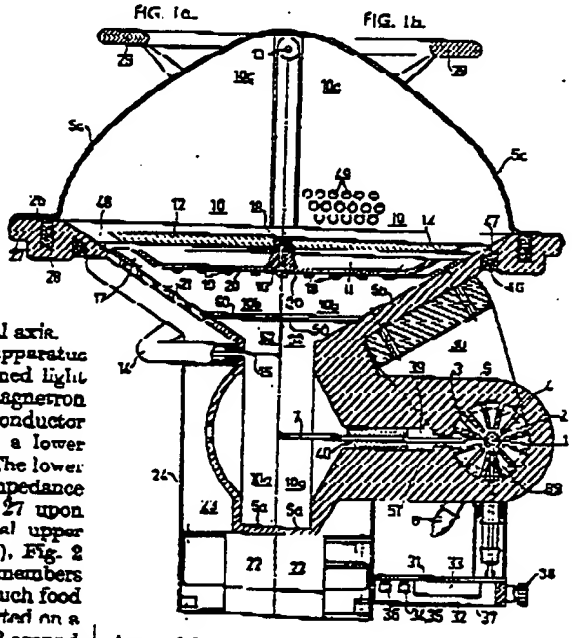
1,161,250. R.F. couplings; microwave ovens. HUSQVARNA VAPENFABRIKS A.B. 23 Dec., 1966 [28 Dec., 1965], No. 57704/66. Headings H4A and H5H.

Apparatus for dielectric heating by means of microwaves comprises a substantially closed metal casing into which power is fed from a magnetron by a waveguide leading to the lower end of an upwardly directed funnel-shaped bottom member of said casing. A substantially horizontal non-metallic carrier means is provided at the top of the funnel-shaped member, for an article to be treated. Close below said carrier means there is provided a horizontally disposed secondary aerial or field stirrer, which is arranged to rotate on a vertical, central axis.

As described, a dielectric heating apparatus comprises a die-cast or otherwise formed light metal structure providing a hollow magnetron anode body 5, Fig. 1, an outer coaxial conductor 51, a rectangular waveguide 5*a*, and a lower member 5*b* of a treatment cavity 10. The lower member 5*b* is funnel-shaped for impedance matching and terminates in a flange 27 upon which rests a domed, perforated metal upper member 5*c* provided with a hinge (25), Fig. 2 (not shown), and a handle 29. The members 5*b*, 5*c* define a treatment cavity 10 in which food or other material to be heated is supported on a steatite plate 12 which has apertures 48 around its circumference and is located in the upper part of the member 5*b*.

The magnetron body 5 contains a central cathode 1 which is surrounded by resonant anode cavities 3 formed by inwardly projecting walls 4, which are coated with copper or silver.



An aerial rod 7 is connected to a wall 4 and is taken coaxially with the bore 51 through a glass or ceramic seal to project into the waveguide 5*a*. The cathode 1 is supplied with filament heating current and high voltage from a unit 32 which is encapsulated, together with connecting means 8, 9, in a metal casing 37. The magnetron

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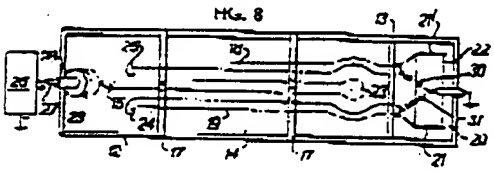

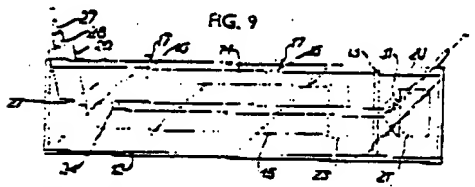

employed each associated with a dielectric liquid of different conductivity or dielectric constant, the two liquids being isolated by a plastic film parallel to the electrodes. The dielectric liquid may be deionized water, ethylene glycol, glycerine or a lower alcohol, having dielectric constants in the range 81—20. A continuously operating ion exchanger can be included so as to maintain the water at low conductivity.

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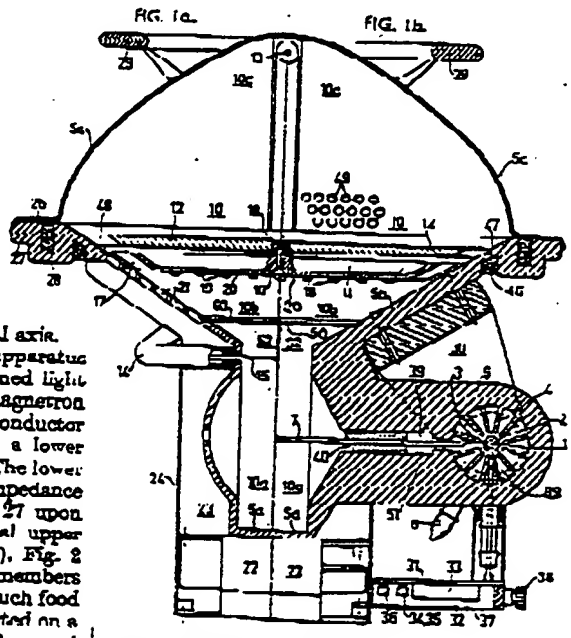
The magnetron body 5 contains a central cathode 1 which is surrounded by resonant mode cavities 3 formed by inwardly projecting walls 4, which are coated with copper or silver.



An aerial rod 7 is connected to a wall 4 and is taken coaxially with the bore 51 through a glass or ceramic seal to project into the waveguide 5a. The cathode 1 is supplied with filament heating current and high voltage from a unit 32 which is encapsulated together with connecting means 8, 9, in a metal casing 37. The magnetron